

Amendment to the Claims

IN THE CLAIMS

1. (canceled)

2. (currently amended): The composition as claimed in claim 11 wherein said acid is sulfuric acid.

3. (currently amended): The composition as claimed in claim 11 wherein said copper salt is selected from the group consisting of copper sulfate, copper acetate, copper fluoborate, cupric nitrate and copper pyrophosphate.

4. (original): The composition as claimed in claim 3 wherein said copper salt is copper sulfate.

5. (currently amended): The composition as claimed in claim 11 wherein said carrier compound is selected from the group consisting of a polysaccharide compound, polyethylene glycol and poly(ethylene oxide).

6. (original) The composition as claimed in claim 5 wherein said polysaccharide carrier is selected from the group consisting of starch, cellulose, amylopectin and amylose.

7. (canceled)

8. (currently amended): The composition as claimed in claim 7 11 wherein said ~~water-soluble, mercapto-containing organic~~ brightener is selected from the group consisting of ammonium diethyldithiocarbamate, 3-mercaptopropanesulfonic acid sodium salt, and 3-mercaptopropanesulfonic acid.

9 - 10. (previously canceled).

11. (currently amended): An acid copper electroplating composition comprising:  
an aqueous solution of an acid and a copper salt; and  
at least one of:  
    a carrier compound;  
    a water-soluble, mercapto-containing organic brightener compound  
    selected from the group consisting of N-methylallyl-N'-methylthiourea,  
    tetramethylthiuram disulfide, ethylethylthiomethyl sulfoxide, ammonium  
    diethyldithiocarbamate, dimethyl-2-thioxo-1,3-dithiole-4,5-dicarboxylate,  
    3-mercaptopropanesulfonic acid sodium salt, 3-mercaptopropanesulfonic acid; bis (2-mercaptoproethyl) sulfide, ethylene trithiocarbonate, ethanethiol, 2-mercaptopropanoic acid, monothioglycerol (1-thioglycerol), 1,2-ethanedithiol, and thiodiethanol; and  
    a leveling compound which comprises an organic compound containing  
    single or multiply positively charged centers, wherein said organic compound is  
    selected from the group consisting of poly[(bis(2-chloroethyl)ether-allyl-1,2-bis[3(-dimethylamino)propyl]urea, quaternized, and  
    poly(diallyldimethylammonium chloride).

12-15. (previously canceled)

16. (currently amended): The composition as claimed in claim 11 further comprising a brightener/carrier molecule.

17. (original): The composition as claimed in claim 16 wherein said brightener/carrier molecule is polymeric protein.

18. (canceled)

19. (currently amended): An acid copper electroplating composition comprising:  
an aqueous solution of an acid and a copper salt;  
at least one of:  
a carrier compound;  
a water-soluble, mercapto-containing organic brightener compound; and  
a leveler compound which comprises an organic compound containing  
single or multiply positively charged centers; wherein said organic  
compound is selected from the group consisting of poly(allylamine);  
poly(allylamine hydrochloride); polyaniline, sulfonated, 5 wt. % in water,  
75 mole % sulfonated; poly[bis(2-chloroethyl)ether-alt-1,3-bis[3-  
(dimethylamino)propyl]urea, quaternized; poly[N,N'-bis(2,2,6,6-  
tetramethyl-4-piperidinyl)-1,6-hexanediamine-co-2,4-dichloro-6-  
morpholino-1,3,5-triazine; polyacrylamide; poly(acrylamide-co-  
diallyldimethylammonium chloride); poly(diallyldimethylammonium  
chloride); poly(melamine-co-formaldehyde), partially methylated; poly(4-  
vinylpyridine), 25% cross-linked; and poly(1,2-dihydro-2,2,4-  
trimethylquinoline); and

a The composition as claimed in claim 18 wherein said carrier/leveler molecule is  
selected from the group consisting of poly[bis(2-chloroethyl)ether-alt-1,3-bis[3-  
(dimethylamino)propyl]urea, quaternized, and poly(melamine-co-formaldehyde).

20. (currently amended): The composition as claimed in claim 11 wherein the weight ratio of carrier to leveler to brightener ranges from about 0.09 to 47.6 : 0.09 to 47.6 : 0.2 to 4.7 weight/weight percent.

21.(canceled)

22. (currently amended): The method as claimed in claim 21 28 wherein said carrier compound is selected from the group consisting of a polysaccharide compound, polyethylene glycol and poly(ethylene oxide).

23. (original): The method as claimed in claim 22 wherein said polysaccharide carrier is selected from the group consisting of starch, cellulose, amylopectin and amylose.

24. (canceled)

25. (canceled)

26-27. (previously canceled)

28. (currently amended): A method for making an acid copper electroplating bath comprising an aqueous solution of acid and copper salt, said method comprising:  
adding to said bath:

a carrier compound;

a water-soluble, mercapto-containing organic brightener compound selected from the group consisting of ammonium diethyldithiocarbamate; 3-mercaptopropanesulfonic acid sodium salt; and 3-mercaptopropanesulfonic acid; and

a leveler compound which comprises an organic compound containing single or multiply positively charged centers, The method as claimed in claim 25 wherein said organic compound is selected from the group consisting of poly[(bis (2-chloroethyl)ether-alt-1,3-bis [3-(dimethylamino)propyl]urea, quaternized, and poly (diallyldimethylammonium chloride).

29 - 32. (previously canceled)

33. (currently amended) The method as claimed in claim 21 28 further comprising a brightener/carrier molecule.

34. (original) The method as claimed in claim 33 wherein said brightener/carrier molecule is polymeric protein.

35. (canceled)

36. (currently amended) A method for making an acid copper electroplating bath comprising an aqueous solution of acid and copper salt, said method comprising:  
adding to said bath:  
a carrier compound;  
a water-soluble, mercapto-containing organic brightener compound;  
a leveler compound which comprises an organic compound containing  
single or multiply positively charged centers, selected from the group  
consisting of poly (allylamine); poly (allylamine hydrochloride); polyaniline,  
sulfonated, 5 wt. % in water, 75 mole % sulfonated; poly[bis (2-  
chloroethyl)ether-alt-1,3-bis[3-(dimethylamino)propyl]urea, quaternized;  
poly[N,N'-bis(2,2,6,6-tetramethyl-4-piperidinyl)-1,6-hexanediamine-co-2,4-  
dichloro-6-morpholino-1,3,5-triazine; polyacrylamide; poly(acrylamide-co-  
diallyldimethylammonium chloride); poly(diallyldimethylammonium  
chloride); poly(melamine-co-formaldehyde), partially methylated; poly(4-  
vinylpyridine), 25% cross-linked; and poly(1,2-dihydro-2,2,4-  
trimethylquinoline); and  
a The method as claimed in claim 35 wherein said carrier/leveler molecule  
is selected from the group consisting of poly[bis(2-chloroethyl/ether-alt-  
1,3-bis[3-(dimethylamino)propyl]]urea, quaternized, and poly(melamine-  
co-formaldehyde).

37. (currently amended): The method as claimed in claim 21 28 further adding at least one of an alkaline source compound and a chloride ion-containing compound.

38. (currently amended): The method as claimed in claim 21 28 wherein said carrier is present in a range of about 2 to 1000 parts per million, said leveler is present in a range

of about 2 to 1000 parts per million and said brightener is present in a range of about 5 to 100 parts per million.

39 - 64. (previously canceled)

65. (new): The composition as claimed in claim 19 wherein said acid is sulfuric acid.

66. (new): The composition as claimed in claim 19 wherein said copper salt is selected from the group consisting of copper sulfate, copper acetate, copper fluoborate, cupric nitrate and copper pyrophosphate.

67. (new): The composition as claimed in claim 66 wherein said copper salt is copper sulfate.

68. (new): The composition as claimed in claim 19 wherein said carrier compound is selected from the group consisting of a polysaccharide compound, polyethylene glycol and poly(ethylene oxide).

69. (new): The composition as claimed in claim 68 wherein said polysaccharide carrier is selected from the group consisting of starch, cellulose, amylopectin and amylose.

70. (new): The composition as claimed in claim 19 wherein said brightener is selected from the group consisting of ammonium diethyldithiocarbamate, 3-mercaptop-1-propanesulfonic acid sodium salt, and 3-mercaptop-1-propanesulfonic acid.

71. (new): The composition as claimed in claim 19 further comprising a brightener/carrier molecule.

72. (new): The composition as claimed in claim 71 wherein said brightener/carrier molecule is polymeric protein.

73. (new): The method as claimed in claim 36 wherein said carrier compound is selected from the group consisting of a polysaccharide compound, polyethylene glycol and poly(ethylene oxide).

74. (new): The method as claimed in claim 73 wherein said polysaccharide carrier is selected from the group consisting of starch, cellulose, amylopectin and amylose.

75. (new): The method as claimed in claim 36 further comprising a brightener/carrier molecule.

76. (new): The method as claimed in claim 75 wherein said brightener/carrier molecule is polymeric protein.

77. (new): The method as claimed in claim 36 further adding at least one of an alkaline source compound and a chloride ion-containing compound.